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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,233	07/28/2005	Tetsuhiko Isobe	520514.00022	8670

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QUARLES & BRADY LLP		
411 E. WISCONSIN AVENUE		
SUITE 2040		
MILWAUKEE, WI 53202-4497		

EXAMINER	
COLEMAN, WILLIAM D	

ART UNIT	PAPER NUMBER
2823	

MAIL DATE	DELIVERY MODE
01/07/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/521,233

Applicant(s)

ISOBE ET AL.

Examiner

W. David Coleman

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2,4-6,8,12-15 and 29-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2,29 and 30 is/are rejected.
- 7) ☒ Claim(s) 4-6,8,12-15 and 31 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

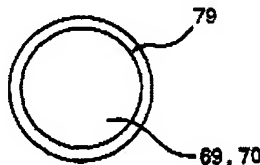
1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 29 and 30 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Bhargava U.S. Patent 5,446,286.

Bhargava discloses an electron-excited nano-crystal phosphor as claimed. See **FIGS. 1-17** and particularly **FIG. 14**.



3. Pertaining to claim 29, Bhargava teaches an electron-excited nano-crystal phosphor made up of at least three parts of nano-sized composite nano-particles comprising:

a core part of nano-crystal phosphor particle **69,70** doped with an activator (the activator in this case is Mn), said phosphor particle being selected from the group consisting of ZnS:Mn, ZnS:Cl, ZnS:Cu, Al, CaS:Eu, CaS:Ce, CaS:Mn, CaS:Cu, CaS:Sb, CaS:Eu, Ce, CaS:Sm, CaS:Pb, CaS:Gd, CaS:Tb, CaS:Dy, CaS:Ho, CaS:Er, CaS:Tm, CaS:yb, MgS:Eu, MgS:Ce, MgS:Mn, SrS:Eu, SrS:Ce, SrS:Mn, BaS:Eu, BaS:Ce and BaS:Mn (in this case Bhargava teaches the phosphors of ZnS:Mn, as disclosed in column 3, line 33);

a surface-modifying part coating the surface of said core part and having a bonding part for bonding the periphery of said core part to a bond defect of said nano-crystal phosphor particle (the surface-modifying part coating in this case is a surfactant of methacrylic acid and poly(methyl methacrylate) which are used to maintain the separation between the particles for quantum confinement. In other word, the surfactants coat the surface of the particles and create a barrier for agglomeration and simultaneously provide surface passivation of the nano-crystalline particles); and

an insulating shell part 79 coating the surface of said surface-modifying part, said insulating shell part being formed of, as a substrate, a substance forming a glass state on the surface of said surface-modifying agent (see column 12, lines 63-68).

4. Pertaining to claim 30, Bhargava teaches a method of preparing an electron-excited nano-crystal phosphor comprising the steps of:

forming a core part of an electron-excited composite of an electron-excited composite nano-crystal phosphor and the surface modifying part for coating the surface of said core part concurrently by a co precipitation method in the presence of both a dispersion-stabilizing dispersion-stabilizing agent and a surface-modifying agent (please see column 7, lines 1-22 which discloses the claimed limitation); and

forming a nano-sized insulating part on the surface of said surface-modifying part;

wherein said nano-crystal phosphor is selected from the group consisting of ZnS:Mn, ZnS:Mn, ZnS:Cl, ZnS:Cu, Al, CaS:Eu, CaS:Ce, CaS:Mn, CaS:Cu, CaS:Sb, CaS:Eu, Ce, CaS:Sm, CaS:Pb, CaS:Gd, CaS:Tb, CaS:Dy, CaS:Ho, CaS:Er, CaS:Tm, CaS:yb, MgS:Eu,

MgS:Ce, MgS:Mn, SrS:Eu, SrS:Ce, SrS:Mn, BaS:Eu, BaS:Ce and BaS:Mn (in this case Bhargava teaches the phosphors of ZnS:Mn, as disclosed in column 3, line 33), and is prepared by a sequential step of adding the sulfide phosphor matrix as an anion material and Group II metal as a cation material so as to co precipitate the anion material and the cation material of the phosphor in that order (please see the steps outlined and disclosed in column 7, lines 1-22).

5. Pertaining to claim 2, Bhargava teaches an electron-excited nano-crystal phosphor as defined in claim 29, wherein the peripheral surface of said core part of said nano-crystal, said surface-modifying part for coating the surface of said core part, and said insulating shell part is charged by the same charge (please note that once the finish product is completed and subjected to an electric field, Bhargava meets this claim limitation).

### *Objections*

6. Claims 4-6, 8, 12-15 and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### *Conclusion*

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

8. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

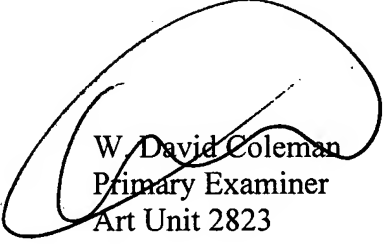
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. David Coleman whose telephone number is 571-272-1856. The examiner can normally be reached on Monday-Friday 9:00 AM - 5:30 PM.

10. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Application/Control Number:  
10/521,233  
Art Unit: 2823

Page 6

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



W. David Coleman  
Primary Examiner  
Art Unit 2823

WDC